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FUKUNAGA KENJI(54) SEMICONDUCTOR DEVICE AND
MANUFACTURE THEREOF

(57) Abstract:

PROBLEM TO BE SOLVED: To enable the threshold voltage of a semiconductor device to be controlled in threshold voltage in the order of a few tenths of a volt by a method, wherein impurities are added to only an active layer provided to the semiconductor device, a concentration distribution of impurity is set discontinuous at an interface between the active layer and a gate-insulating film, and the control of a threshold voltage is carried out, taking advantage of residual impurities in the active layer adjacent to its interface with the gate insulating film.

SOLUTION: A crystalline silicon film 203 is formed on a substrate 201 possessed of an insulating surface through the intermediary of a base film 202 to serve as an active layer. The crystalline silicon film 203 is subjected to a thermal oxidation treatment so as to obtain a gate-insulating film, and an island-shaped semiconductor layer 204 which forms the active layer of an N-channel TFT and an island-shaped semiconductor layer 205 which forms the active layer of a P-channel TFT are formed by patterning. After the island-shaped semiconductor layer 204 has been covered with a resist mask 206, B-ions as impurity ions are added to only the island-shaped semiconductor layer 205. The concentration distribution of impurity is set discontinuous at an interface between the island-shaped semiconductor layer 205 and the gate-insulating film, and a threshold voltage is controlled, taking advantage of the residual B-ions located adjacent to the interface.

